INSTRUCTION MANUAL FOR MODEL 122C

MP MASTER
MA23369

GÅRDSFOGDEVÄGEN 18 A
BOX 20036
S-161 20 BROMMA
SWEDEN
TELEPHONE 08/29 04 60

MAGNETIC AB
MANUFACTURING DIVISION • BROMMA, SWEDEN

Digitized by the Internet Archive
in 2026

https://archive.org/details/manualsplus_12040

OPERATING INFORMATION

Due to a transformer effect between plasma and helix, a spike occurs which may be damaging when measuring the noise figure of fragile devices. To protect equipment from these surges, a suitable high-pass filter should be utilized. The spike occurs during the noise tube ignition interval.

OPERATING NOTES

NOISE SOURCE MODEL 122C

MAGNETIC AB
Stockholm - Sweden

1. SPECIFICATION

FREQUENCY RANGE:	300-3000 MHz, 250 to 4000 MHz with correction factor.
EXCESS NOISE:	15.6 dB ± 0.2 dB (from noise tube)
GAS TUBE:	TD-72 (argon)

VSWR[x]:

	Fired	Unfired	
300 - 500 MHz	1.3	1.7	max
500 - 2600 MHz	1.3	1.6	max
2600 - 3000 MHz	1.35	1.6	max
3000 - 4000 MHz	1.5	10	typical

OUTPUT CONNECTORS:	Type N, female, 50 ohm
DISCHARGE CURRENT:	175 mA, current supplied by Magnetic AB Noise Figure Meters
INPUT CABLE:	1.5 meters, terminated in a UG-932/U connector (Type MHV)
DIMENSIONS:	390 x 80 x 50 mm (L x W x H)
ACCESSORIES AVAILABLE:	50 ohm termination, Model 951B

[x]Source terminated in a well matched load such as the model 951B

2. DESCRIPTION

The Magnetic Model 122C Noise Source uses a gas discharge tube as a noise generator. In order to get small dimensions and a wide bandwidth a helical transmission line has been used instead of the more common waveguide, which is rather awkward to handle at these frequencies. Model 122C covers the frequency range 300 to 3000 MHz and can be used over the range 250 to 4000 MHz with a correction curve.

The noise generator is an argon-gas discharge tube (Signalite TD-72) which is inserted in a helical transmission line. The dimensions of this helix have been chosen so that its impedance is 50 ohms. In each end of the helix there are transitions to type N connectors. The impedance is constant over the frequency band (see specification). There is a slight change in impedance when the source is switched from the unfired to the fired condition (see fig. 1).

3. OPERATION

The Model 122C Noise Source is designed for use with Magnetic AB Noise Figure Meters, which supply the required power. The source should be terminated in a 50 ohm load such as model 951B.

3.1 Other Signalite Noise Tubes can be used in this noise source (mount):

TD-44 (neon-filled gas-discharge tube) generates 17.9 dB of excess noise at a discharge current of 175 mA.

For manual measurements (3 dB method, twice power) two tubes are available, e.g.:

TD-11 (argon) with an excess noise of 15.55 dB at 200 mA

TD-23 (neon) with an excess noise of 17.95 dB at 200 mA.

The cathode connector can be rewired so that the heater can be fed with the appropriate voltage for starting purposes when the DC-tubes (TD-11 and TD-23) are used.

3.2 Correction factor

Fig. 2 shows the decrease in excess noise at low frequencies. As the frequency is lowered the excess noise from the source decreases due to the fact that the helix becomes shorter compared with the wavelength. This means that the coupling between the helix and the discharge plasma decreases. This can be estimated by measuring the hot and the cold transmission loss of the noise source. The decrease in excess noise can then be computed from:

$$dP = 10 \log \left(1 - \frac{10 \log Ds}{10 \log Dt}\right) \times \left(1 - \frac{1}{Dt}\right) \quad dB$$

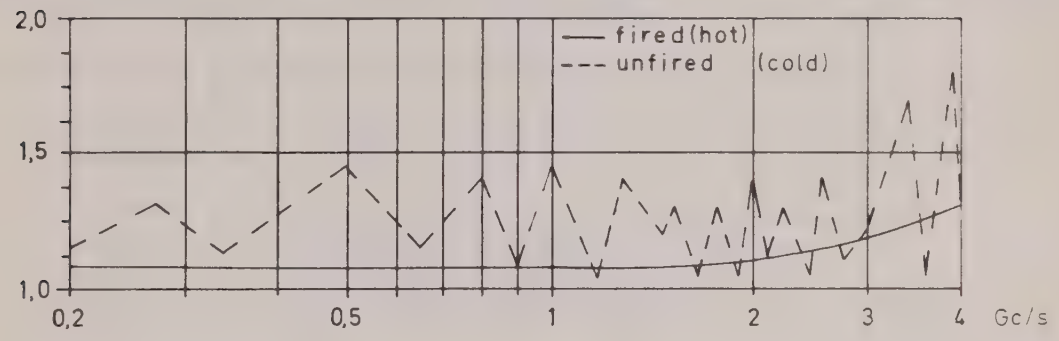


Fig. 1 VSWR vs frequency for Noise Source Model 122C (typical).
SVF som funktion av frekvensen.

Decrease in excess noise.
(Minskning i bruseffekt).

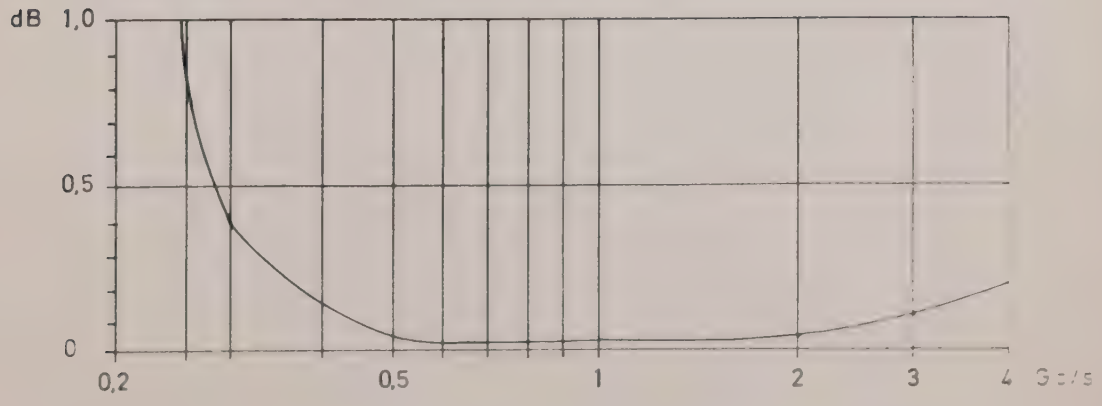


Fig. 2 Noise output vs frequency for Noise Source Model 122C.
Bruseffekt som funktion av frekvensen.

where, Ds = cold transmission loss

Dt = hot transmission loss

See also fig. 3.5 in the Model 113 Instruction Manual.

4. MAINTENANCE

The only replacable part of Noise Source Model 122C is the discharge tube. The life is expected to be in the order of 2000 hours.

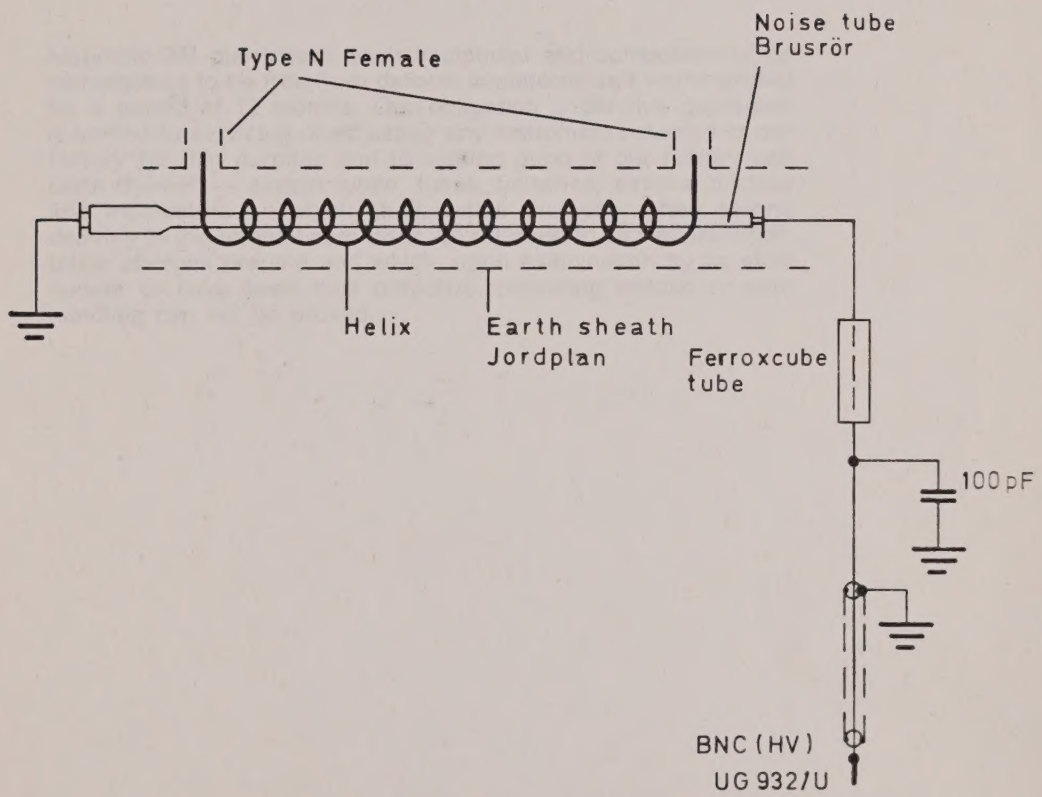
To remove the tube from the mount proceed as follows:

a. Take off the bottom of the case. The mount is now accessible.

b. Unscrew the knurled ring at the cathode end, and detach the connector and remove the tube.

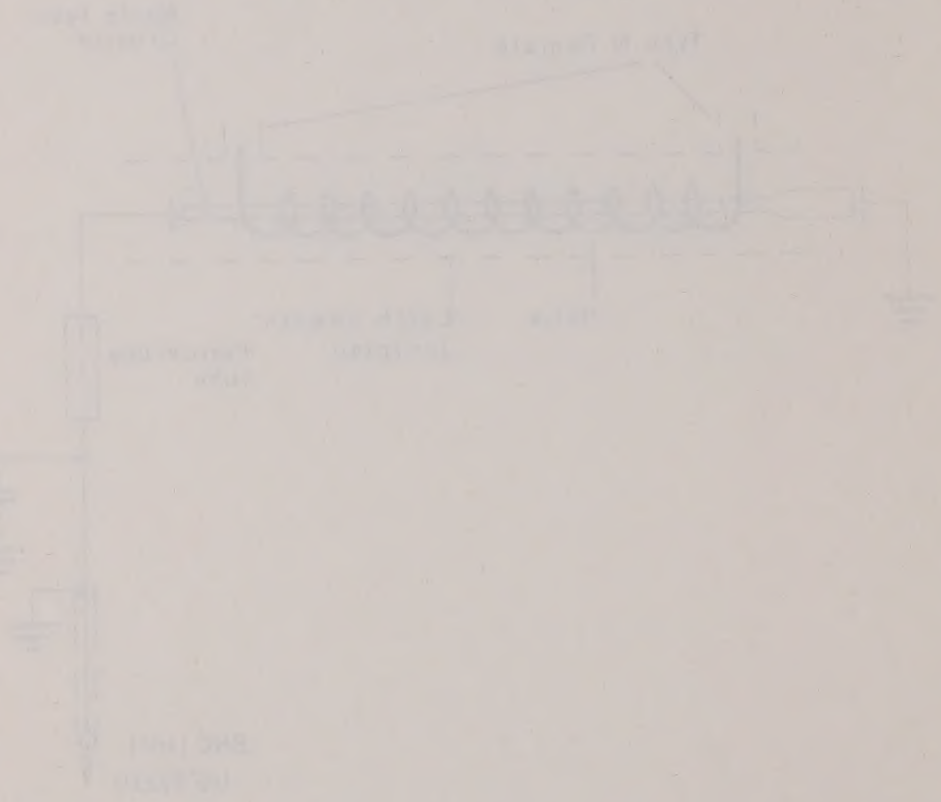
c. Insertion of the tube should be done in the reverse order.

DO NOT ATTEMPT TO TAKE THE NOISE SOURCE (MOUNT)
APART AS ITS PERFORMANCE WILL BE IMPAIRED.



A

Fig. 3 Schematic diagram for model 122C
Principschema för modell 122C



Guarantee

Magnetic AB guarantees each equipment and component of its manufacture to be free from defects in material and workmanship for a period of 12 months. Our obligation under this guarantee is limited to servicing or adjusting any instrument returned to our factory for that purpose and to making good at our factory and parts thereof — except tubes, fuses, batteries, semiconductors and bolometers — which shall, within one year after making delivery to the original purchaser, be returned to us with transportation charges prepaid and which, upon examination by us shall appear to have been thus defective, providing misuse or mal-handling can not be proved.

RETURN PROCEDURE:

When returning instruments or components for repair, or for any other reason, please contact the company for shipping instructions. To expedite repair service, it is very important to provide **type number, serial number,** and a **detailed description of the reason for the return of the instrument.**

Magnetic AB

Street Addr: Gårdsfogdevägen 18 A
Mail: Box 20036, S-161 20 Bromma 20, Sweden
Telephone: 08/29 04 60
Cable: Magnetic, Stockholm
Telex: 19037

MP MASTER

MA23369